## Voltage Recorder RVR-52　Warranty

| | |
|---|---|
| Customer's name:<br>Address:<br>Phone No.: | |
| Dealer's name:<br>Address:<br>Phone No.: | |
| Guarantee period | 12 months from date of purchase |
| Date of purchase | |

### Provisions for Free Repair

1. If the unit does not work properly despite the fact that the customer used it properly and in line with the User's Manual, the unit shall be repaired free of charge through the distributor from which the unit was purchased.
2. If the customer requests free repair because of trouble within the warranty period, bring or send the unit along with the warranty to the dealer. A service charge may be added if a repairperson must be sent out to the place of use for repair.
3. If you have moved after purchasing, or the product was received as a gift, or there are some difficulties contacting the shop from which you purchased the unit, please contact us directly for service.
4. Free repair is not available in the following cases even though it is within the warranty period:
   1. Trouble or damage was caused by careless operation, natural disaster, fire, public pollution, or use of a power source other than specified.
   2. If repair, adjustment, disassembly or modification of the unit has been carried out by a person other than a T&D authorized engineer.
   3. Trouble or damage was caused by transportation, movement or dropping of the unit after purchase.
   4. Failure to submit the Warranty or failure to fill in all items required in the Warranty.
5. The Warranty cannot be reissued.
   This Warranty only promises customers free repair within the period and conditions clarified in this Warranty. Therefore, the customer's legal rights will not be limited by this Warranty. For further information on repair and other service questions after the termination of the warranty period, contact your dealer.

R100 This is printed on 100% recycled paper.

## ⚠Wireless Regulations

### Radio, EMC and Safety Regulations

CE ⓘ

- RTR-5 Series complies with technical specifications required under EN 301 489-3 (with battery and AC Adaptor), EN 300-220-3 and EN 60950:2000.
- Allowed to use in : A.B.D.DK.F.I.P.S.SW.UK.N.NL.CH. FIN.AUS.NZ

### Inquiries

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# Voltage Recorder
## RVR-52

Wireless Data Logger for Voltage and Pulse

## User's Manual

Thank you for purchasing this product.
Carefully read and fully understand these instructions before using this unit.

**T&D CORPORATION**

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2003.08 16004334030

## Specifications

| | |
|---|---|
| Measurement Channels | 1 Channel ( Select from: Voltage ／ Pulse ／ Event Time ) |
| Voltage: | |
| Input Voltage Range | 0 to 6.5V |
| Measurement Resolution | 1mV |
| Measurement Accuracy | ±0.5% +5dgt. (at 0 to 40℃ ) |
| Input Impedance | Approx. 1M Ω |
| Pulse: | |
| Input Voltage Range | 0 to 30V |
| Detection Voltage | Lo: below 0.6V ／ Hi: above 2V |
| Response Time | 30Hz ／ Approx. 15 msec or more (over 2.5V) |
| Response Polarity | Select Lo → Hi or Hi → Lo |
| Highest No. of Counts | 32000 |
| Input Impedance | Pull-up Resistor Approx. 100k Ω |
| Event: | |
| Input Voltage Range | 0 to 30V |
| Measurement Resolution | 1 sec |
| Detection Voltage | Lo: below 0.6V ／ Hi: above 2V |
| Response Time | 1 sec |
| Response Polarity | Both Lo → Hi and Hi → Lo |
| Input Impedance | Pull-up Resistor Approx. 100k Ω |
| Recording Intervals | 1, 2, 5, 10, 15, 20, 30 seconds ／ 1, 2, 5, 10, 15, 20, 30, 60 minutes<br>Total of 15 choices (Excluding Event data) |
| Recording Capacity | Voltage ／ Pulse 16,000 Readings・Event 8,000 Readings |
| Recording Mode | Endless Mode・One-Time Mode |
| LCD Display Items | Current Readings・Recording Settings・Battery Life Warning<br>Over Measurement Range Warning・Unit. |
| Power | Lithium Battery (LS14250 (SAFT)) x1 or AC Adaptor (Sold separately) |
| Battery Life | Approx. 6 months<br>(Battery life dapends on measurement environment, recording interval and battery performance) |
| Wireless Method | ETSI EN 300-220 |
| Transmission Distance | Up to 100 meters (May vary with conditions) |
| Interface | Wireless Communication (RTR-57C)<br>Optical Communication (RTR-57C, TR-50C) |
| Communication Speed | When downloading (wireless) Approx. 2000 readings per minute<br>[Collection of a full unit of data=Approx. 420 seconds<br>(optical communication=Approx. 160 seconds)] |
| Water Resistance ※ 1 | IP64 (rated for use in daily life) ※ 2 |
| Dimensions | H62 x W47 x D19mm (excluding protrusions ／ antenna length 20mm)<br>with Large Capacity Battery Pack: D50mm |
| Weight | Approx. 56g. (including 1 lithium battery)<br>with Large Capacity Battery Pack: Approx. 109g |
| Unit Temp. Resistance | -40 to 80℃ |
| Standard Input Cable | RVR-7101 (Length: Approx. 1.5m) x 1 |
| Accessories Included | Lithium Battery (LS14250 (SAFT)) x 1・Tube x 1・Strap x 1<br>User's Manual (Warranty) x 1 |

※ **1** Not for continued immersion.
※ **2** Note:The water resistance rating with the sensor or input cable connected is IP64.

## ◆ Notices about this User's Manual

- Please read this manual carefully before using the product.
- All rights of this User's Manual belong to T&D Corporation. It is prohibited to use, duplicate and/or arrange a part or whole of this User's Manual without the permission of T&D Corporation.
- Please follow the safety precautions carefully. We cannot guarantee nor or we responsible for safety if this product is used in any manner other than was intended.
- T&D Corporation accepts no responsibility for any malfunction of and/or trouble with this product or with your computer that is caused by the improper handling of this product and will deem such trouble or malfunction as falling outside the conditions for free repair of the attached warranty.
- T&D Corporation accepts no responsibility for any result or effects from using this User's Manual.
- Figures and illustrations in this manual may be slightly simplified and may differ from the actual product.
- On screen messages, figures or illustrations in this manual may vary slightly or be simplified from the actual messages and product.
- We sincerely hope that the contents of this manual are true and complete. If you find any information to have omitted, or if the information within is confusing or mistaken please, contact your retailer or T&D Corporation.
- Microsoft®, Windows® and WindowsNT® are registered trademarks of Microsoft Corporation USA and are binding in the USA and all other countries. Company names and product names are trademarks or registered trademarks of each company.
- This User's Manual cannot be reissued, so please keep it in a safe place.
- Please carefully read this User's Manual and Warranty.

## ◆ Safety Precautions and Instructions

※ Please carefully observe the following safety measures when using our product.

To prevent any loss or damage to our customers, other people and/or property, and to ensure the proper use of our products we ask that before using our product you carefully read, understand and follow the safety rules and precautions for our products as outlined below.

**【Explanation of Warning Symbols】**

| | |
|---|---|
| ⚠DANGER | These entries are actions that absolutely under no circumstance should be taken. The taking of such an action may cause serious personal physical damage or death. |
| ⚠CAUTION | These entries are actions that if taken may lead to physical injury or damage to persons or things. |

**【Explanation of Picture Symbols】**

| | |
|---|---|
| △ | This symbol denotes an important warning or caution. Inside or near the symbol will appear another symbol giving details.<br>(EX: ⚠ stands for ELECTROCUTION) |
| ⃠ | This symbol denotes a forbidden action. Inside or near the symbol will appear another symbol giving details.<br>(EX: Ⓢ stands for DO NOT TAKE APART) |
| ● | This symbol denotes an action that you must take. Inside or near the symbol will appear another symbol giving details.<br>(EX: ❗ stands for TAKE PLUG OUT OF SOCKET) |

### ⚠DANGER

**Do not take apart, repair or modify the main unit.**
It may cause fire, electrocution or damage. Ask the shop where you purchased the products or T&D Corporation to carry out any repairs.

**If any smoke or strange smells are emitted from the unit, immediately cease using it.**
Continued use may cause fire, electrocution or damage.

**Do not use any batteries other than those that are recommended. It may cause fire or damage.**

**Do not use the input cable if it has water droplets or if your hands are wet.**
It may cause electric shock.

**If water or a foreign body enters the case, immediately cease using it.**

**Store all batteries, sensors and Data Logger units out of the reach of children. It is dangerous to swallow batteries.**

**Please be careful when you using in overly hot or cold environments, touching the units may cause burns or frostbite.**

**RVR-52 has been designed to measure voltage and pulse. Do not use it for any other purpose than to measure pulse and voltage.**

### ⚠CAUTION

**We are not responsible for any malfunction or trouble caused by the use of our product or by any problem caused by the malfunction of our unit. Please be fully aware of this before using our product.**

**This product has been designed for private or industrial use only. It is not for use in situations where strict safety precautions are necessary such as in connection with medical equipment whether directly or indirectly.**

**Operate the units with [T&D Recorder for Windows® Ver1.00(E)]**

**This product is designed to measure voltage up to +6.5V at a voltage input of up to +30V.**
If used at a high voltage, such as AC100V, the signal production element and/or the product may be damaged.

**Do not drop or expose the unit to strong impact.**

**Do not use or store the unit in places such as listed below:**
**It may cause electrocution, fire or damage to the unit or to your computer.**

- Areas exposed to direct sunlight
- Areas exposed to water or high-pressure water flow.
- Areas exposed to organic solvents and corrosive gas.
- Areas exposed to strong magnetic fields
- Areas exposed to static electricity.
- Areas exposed to fire or overheating.
- Areas exposed to excessive dust or smoke.

**A sudden change in widely different temperature environments may cause condensation to occur.**
Please use the unit in areas with a temperature range of 0 to 50℃ and a humidity range of 10 to 90%RH (with no condensation)

**Do not place any foreign objects in the input cable jack.**

**Battery life depends on the measurement environment, communication frequency, recording interval and battery quality.**

**Battery terminals may provide insufficient contact due to age or vibration. Please be careful not to lose data due to insufficient contact.**

**The main unit when connected to the input jack is splash proof. Without the input cable connected the unit is not waterproof, so please do not allow it to become wet.**

**Remove batteries from any unit that is not to be used for a long period of time.**
Batteries left in a unit not being used for a long time may leak and cause a malfunction.

**Pay attention to water leakage or foreign objects entering into the unit case as in the following cases.**

- The case was closed with dust, hair, etc., on the rubber packing or in the groove for the packing.
- The rubber packing becomes damaged. (In this case, please purchase the optional maintenance set.)
- The unit suffered from significant temperature change while wet. Especially if the temperature change is from high to low.

# About Voltage Recorder RVR-52

## ◆ Outline of System

This system makes use of the RVR-52 unit to measure and record voltage, pulse and event data, which can then be downloaded via wireless transmission to our handheld RTR-57C Data Collector Unit. The RTR-57C unit can then be connected to your computer for data analysis and management with our exclusive software.

Besides the collection of recorded data, it is possible to monitor current readings, start recording and check data anytime without physically collecting the RVR-52 units. Communication between units can be done via optical communication, as well as wireless communication.

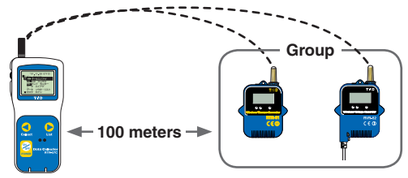
## ◆ Basic Functions

### ● Wireless Communication Function

Via special short wave radio communication, recorded data can be downloaded from an RVR-52 unit and saved to the RTR-57C Data Collector Unit. Recording settings and recording start can also be controlled via wireless communication.

**Note:**

In order to collect data via wireless communication, it is necessary to register via computer the RVR-52 unit as a Remote Unit in the RTR-57C unit you wish to use. For details about making these settings, please see the Help Menu in [T&D Recorder for Windows] or the User's Manual for [T&D Recorder for Windows].




※ The wireless communication range, if unobstructed and direct, is about 100 meters.

Connect your computer to the RTR-57C unit and simply place an RVR-52 unit face down on an RTR-57C to carry out direct optical communication with your computer.

### ● Pulse Measurement: 30 Counts per Second

RVR-52 can measure up to 30 counts (30Hz) per second when the input voltage range is between 0-30V and there is a continuous pulse of more than 15 seconds. When measuring pulse, the largest number of counts for one recording interval is 32,000 counts. You can select from rising signal (Lo-Hi) or falling signal (Hi-Lo) and count when one or the other occurs.

### ● Voltage Measurement Range: 0–6.5V

RVR-52 can measure and record input voltage from 0 to 6.5V. You can choose to record the voltage measurement as the instantaneous value for each recording interval span or as the average value for each recording interval span. The average value for recording intervals under 15 seconds will be calculated as the average of the measurements from every 1 second. The average for intervals over 20 seconds will be calculated as the average of the measurements from every 2 seconds.

### ● Event Time Recording

RVR-52 can record the time of any event; a rising (Lo to Hi) or falling (Hi to Lo) waveform that occurs for more than 1 second at an input voltage range of between 0-30V.

### ● Recorded Data Capacity: 16,000 Readings

**Calculation Example :** 30sec (recording nterval) × 16,000 readings (capacity limit) = 480,000 seconds = about 5 days and 13 hours.

| Recording Interval | 1 second | 30 seconds | 15 minutes | 60 minutes |
|---|---|---|---|---|
| Time period | 4 hours 26 min. | 5 days 13 hours | 166 days 16 hours | 1 year 10 months |

### ● Recording Condition Settings

Settings such as Recording Mode, Recording Interval, Programmed Start Time, Immediate Start, and Measurement Contents (Voltage / Pulse) can be easily made via an RTR-57C unit or by computer.

**Note:** By starting a new recording session, all previously recorded data will be erased from the main unit. If you wish to save the data, make sure to download it to an RTR-57C unit or to your computer before beginning a new recording session.

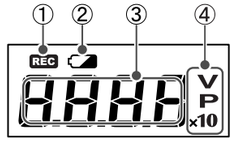
### ● Downloading Recorded Data (Data Collection)

Data downloaded to your computer can be processed into graphs, lists, saved to files, changed to text file, and printed out.

### ● Setting Upper and Lower Limits

By setting upper and lower limits, a check will occur for data exceeding those limits each time data is downloaded to an RTR-57C unit.

# About the LCD Display




① LIT UP: displayed during recording or when FULL of data.
BLINKING: displayed when waiting for a programmed recording to start

② Low Battery Life Warning Indicator: displayed when time to change the battery.

③ Current Reading or Operation Message displayed

④ Shows Unit of Current Reading being displayed
V: Voltage, P: Pulse, x10: Pulse

### ● Check

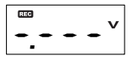
This is displayed under the following conditions: after purchasing and putting in the batteries for the first time, if the battery terminals +/- were mistaken and a short occurred, or if the batteries are replaced after having been taken out for a long period. If this is displayed all data that had been stored in the main unit has been erased.

### ● Full Memory

If recording under the ONE TIME MODE, when the data readings reach the upper limit of 8,000 readings, recording will stop and this will be displayed intermittently with the current temperature.

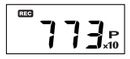
### ● Wireless Transmission

This will be displayed when transmitting data to an RTR-57C unit via wireless communication.




### ● Over Measurement Range (only for Voltage Measurement)

Display will blink if measurement is below 0 or above 6.5 V

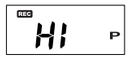



### ● Over 10,000 Pulse Count Readings Display

On tenth of readings will be displayed with a P and x10.

### About the Pulse Measurement Display

The reading shown on the pulse measurement display shows the number of total pulse counts for the recording interval set at the recording start and changes every one sixtieth of the time of the set recording interval.
For example: If the recording interval is set at 30 minutes, the display will show the total number of pulse counts for the previous thirty minutes; changing at a rate of every thirty seconds. (If the interval is set at 1 minute or less, the measurement count and the display will change every second.)




### ● Signal Level at time of Event Recording

If the current signal level is high, HI will be displayed.

### ● Signal Level at time of Event Recording

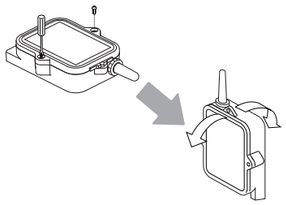
If the current signal level is low, Lo will be displayed.

**Note:** Use in cold environments may cause the display to be difficult to read; this is not a malfunction.

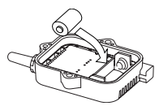
# Before Using

## ◆ Insert the batteries

**1.** Remove the screws and take off the back case.

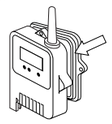


**2.** Insert the battery in its tube and place in unit as in diagram.



● Make sure that + and - are correct.

**3.** Check the rubber packing for any cuts or scratches and replace the cover as it was when opened.



● If dirt or scratches are present on the rubber packing, water resistance will be reduced.

● Be sure to fasten the cover tightly.

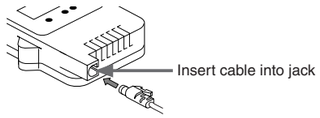
※ If nothing appears on the LCD Display, please follow the above instructions again.

**NOTE:**

● When changing batteries make sure to carefully read [Changing Batteries].

● Make sure no water gets inside the case.

## ◆ Connect the Input Cable




**NOTE:**

Confirm that the sensor is properly connected by inserting it until you hear a clicking sound.

## ◆ Upon insertion of the batteries, measuring and recording will automatically begin at the factory set default recording settings, or if replacing the batteries the settings will return to the most recent recording settings.

The default settings are: Recording Mode: Endless / Recording Interval: 10 minutes / Recording Start: Immediate Start (Measurement and recording will automatically begin in Voltage Measurement Mode.)

# Changing the Battery

**Note:**

● Once the battery indicator [BAT] appears, replace the old battery with a new one as soon as possible.

● After removing the old battery, all recorded data will be lost if a new battery is not inserted within 1 minute. Make sure to complete the battery change within 1 minute.

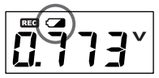
● If the battery direction is incorrect (+/-) and a short occurs, all recorded data saved in the main unit will be lost.

● Please store the LS14250 batteries in a temperature of less than 20℃ .

● When using an LS14250 battery, the battery indicator [BAT] on the main unit display may not soon disappear, even if you have used a new battery. This is due to the nature of the battery and the time it will take for the indicator to disappear will increase with the time that the battery has been in storage. If a battery has been in storage for about one year, it will take about 10 minutes for the indicator to disappear. During this time, if you try to collect Remote Unit Info via the RTR-57C it will respond that the battery level is too low.

**1.** When battery power becomes low, the battery indicator (BAT) will appear in the LCD display.

● If you change the battery at this time, recording will continue uninterrupted and the downloading of recorded data is possible.




If you do not change.
Recording: OK
Wireless Communication: OK
Data Download: OK

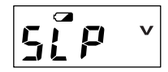
**2.** If you do not change the battery and continue using the unit, the temperature display will intermittently display {bAtt}. Please change the battery at once.

● If at this time a new battery is placed in the unit, recording will continue and downloading of saved data can be done.

If you do not change.
Recording: OK
Wireless Communication: NO
Data Download: NO

**3.** If you continue to use without changing the battery, the recording indicator (REC) will disappear and the display will read [SLP].

● In order to save all recorded data during [SLP], all recording and other normal functions will be disabled. If you change the battery at this time all recorded data can still be downloaded.




If you do not change.
Recording: NO
Wireless Communication: NO
Data Download: NO

● If, after changing the battery, you wish to start recording again, please make new recording start settings via computer or via the RTR-57C unit.

**NOTE:**

By starting a new recording session, all previously recorded data will be erased. Make sure to download any data you need before you start a new recording session.

**4.** If you do not change the battery even under conditions in 3 above, the display will go blank.

● All of the recorded data will be erased. If at this time a new battery is placed in the unit, [CHEC] will appear on the display after which recording will begin again using the previously set recording conditions.